

Parasitoids of butterflies and moths (Insecta: Lepidoptera) from the Maltese Islands

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Butterflies and moths are commonly subjected to parasitoids that lay their eggs on or in their host, usually during the egg, larval or pupal stage. When the egg of the parasitoid hatches, the parasitoid larva feeds on the host Lepidoptera, killing it in the process. These parasitoids usually belong to the orders Hymenoptera and Diptera. Hence only these two orders were mentioned in the present study. The main objective of the present work was to collect data on such parasitoids from the Maltese Islands. This was done through; (i) collecting Lepidoptera and rearing of their parasitoids, (ii) reviewing the available literature on parasitoids of Lepidoptera in the Maltese Islands, and (iii) examining existing collections of insect parasitoids from the Maltese Islands. This information further served as reference on the tritrophic relationships of parasitoids of Lepidoptera in the Maltese Islands.

Information about the parasitoids of Lepidoptera, host species and their food plants was obtained through rearing exercises. This involved collecting Lepidoptera larvae and pupae from different host plants from various localities in Malta and Gozo using different methods according to feeding behaviour. The captured Lepidoptera species were then kept in closed containers, replenishing the food plant when necessary, so that any emerging parasitoids could be noted and isolated. Hence, the parasitoids emerged could be attributed to their particular host, for which the food plant was known. Parasitoids were then mounted on cards together with a data label containing all relevant information. The parasitoids collected, together with donated parasitoid collections, were examined and identified to species level.

The recorded species of parasitoids included one dipteran species, *Prosopea nigricans*, from the family Tachinidae. This species was noted to emerge from *Cryphia* sp. Although this parasitoid was not a new record for the Maltese Islands, there had not yet been any previous host data recorded. In addition to this, forty species of Hymenoptera belonging to the families Ichneumonidae, Braconidae, Chalcididae and Eulophidae

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were recorded; these include (i) ten species from the family Ichneumonidae, five of which are new records for the Maltese Islands; (ii) fifteen species from the family Braconidae, six of which are new records for the Maltese Islands; (iii) one newly recorded species from the family Chalcididae; and (iv) fourteen records from the family Eulophidae, twelve of which are new records for the Maltese Islands. Some previously published braconids were based on misidentifications.

Through the present study, the number of parasitoids of Lepidoptera recorded from the Maltese Islands has increased from thirty-three to sixty-five species. The species recorded are attributed to forty host species of Lepidoptera. Certainly more work needs to be done considering the fact that more than 650 species of Lepidoptera are recorded from the Maltese Islands.